

## REMARKS

Claims 1-14 were pending in the application at the time of the Office Action. Claim 3 is amended. Claims 1 and 2 were withdrawn by the Examiner. Accordingly, claims 1 and 2 are cancelled without prejudice or disclaimer. Claims 15 and 16 are newly added. No new matter is added. Accordingly, claims 3-16 are pending in the application for consideration.

### Elections/Restrictions

As noted above, claims 1 and 2 were withdrawn by the Examiner. Accordingly, claims 1 and 2 are cancelled without prejudice or disclaimer.

### Claim Rejections Under 35 U.S.C. 103

On page 2 of the Office Action, claims 3 and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over Eyidi et al. ("Eyidi," "Growth of CeO<sub>2</sub> thin films") in view of Hans Thieme et al. ("Hans Thieme," U.S. Patent No. 6,458,223), Fujimoto et al. ("Fujimoto," U.S. Patent 5,498,881) and Hsu ("Hsu," U.S. Patent No. 6,569,745).

On page 4 of the Office Action, claims 6 and 12 were rejected under 35 U.S.C. 103(a) as being unpatentable over Eyidi in view of Hans Thieme, Fujimoto, Hsu and Akedo et al. ("Akedo," U.S. Patent 6,827,634).

On page 4 of the Office Action, claims 4, 5, 10 and 11 were rejected under 35 U.S.C. 103(a) as being unpatentable over Eyidi in view of Hans Thieme, Fujimoto, Hsu and Goyal et al. ("Goyal," U.S. Patent 6,451,450).

On page 5 of the Office Action, claims 7, 8, 13 and 14 were rejected under 35 U.S.C. 103(a) as being unpatentable over Eyidi in view of Hans Thieme, Fujimoto, Hsu, Goyal and Akedo.

The above rejections are respectfully traversed.

As will be explained in more detail below, the cited references (e.g., Fujimoto and Akedo) do not disclose or suggest features of the rejected claims. For example, the cited

references do not disclose or suggest “planarizing a textured metal substrate to have a surface layer . . . with a crystal axis offset relative to an orientation axis by at most 25°[,]” as recited in claim 3. (Emphasis added.) In rejecting claim 3, the Examiner cites disclosure in Fujimoto (i.e., description of an angle of 30° in a discontinuous portion). However, Applicants respectfully submit that this citation does not establish a *prima facie* case of obviousness.

Claim 3 recites a method including, among other features, “planarizing a textured metal substrate to have a surface layer extending from a surface thereof to a depth of 300 nm with a crystal axis offset relative to an orientation axis by at most 25°, and a surface roughness  $R_{P-V}$  of at most 150 nm[.]” (Emphasis added.)

On page 3 of the Office Action, the Examiner acknowledges that Eyidi fails to teach features of claim 3, including features noted above.

However, the Examiner contends that Fujimoto and Hans Thieme teach features of claim 3 and that it would have obvious to combine the references to arrive at claim 3. Regarding the disclosure of Fujimoto, the Examiner contends: “The prior art range is so close that one skilled in the art would have expected it to have the same properties.”

Applicants respectfully traverse these contentions for reasons explained below.

For example, Applicants respectfully submit that none of the cited references (including Fujimoto) discloses or suggests “planarizing a textured metal substrate to have a surface layer extending from a surface thereof to a depth of 300 nm with a crystal axis offset relative to an orientation axis by at most 25°, and a surface roughness  $R_{P-V}$  of at most 150 nm[.]” as recited in claim 3. (Emphasis added.)

Fujimoto describes a substrate 4 having a discontinuous portion 1, at which an angle ( $\theta$ ) of 30° is formed. (See Fujimoto, col. 5, lines 22-24, and Fig. 7C.) This disclosure of an angle ( $\theta$ ) measuring 30° does not disclose or suggest “a surface layer . . . with a crystal axis offset relative to an orientation axis by **at most 25°[,]**” as recited in claim 3. (Emphasis added.)

In apparent acknowledgement of the above, the Examiner contends that “[t]he prior art range is so close that one skilled in the art would have expected it to have the same properties.”

Applicants respectfully traverse the above contention. That is, the angle ( $\theta$ ) of 30°, as described in Fujimoto, is not so close to the range recited in claim 3 (i.e., a crystal axis offset relative to an orientation axis by **at most 25°**) such that they would be expected to have the same properties.

In contrast, Applicants’ specification provides that different properties would be obtained. For example, Applicants’ specification provides that, “[i]f in the surface layer the crystal axis offsets relative to the orientation axis by an angle exceeding 25°, significantly biaxially textured intermediate and superconducting layers cannot be obtained. (Applicants’ specification, page 5, lines 23-25.) (Emphasis added.)

Furthermore, Applicants’ specification provides experimental data that describes differences in properties in more detail. (See, for example, Applicants’ specification, pages 12 to 22.) For example, regarding the “second comparative example,” Applicants’ specification provides:

In the second comparative example the textured metal substrate had surface roughness  $R_{p-v}$  smaller than 150 nm. However, its surface layer provided a crystal axis offset relative to an orientation axis by an angle exceeding 25° and did not have a (200) plane providing orientation. This results in an intermediate layer having a (200) plane without orientation and also provided a critical current density of 0 MA/cm<sup>2</sup>. Furthermore if planarizing the substrate resulted in a surface layer having a (200) plane completely losing orientation, thermally treating the substrate in the reducing atmosphere was unable to recover the surface layer's lost orientation.that is formed. (Applicants’ specification, page 21, lines 5-13.)

In contrast, regarding the “first and second examples,” Applicants’ specification provides:

By contrast, the first and second examples both provided a textured metal substrate with a surface layer having a crystal axis offset relative to an orientation axis by at most 25° and a (200) plane providing significant

orientation, and also having surface roughness  $R_{p-v}$  of at most 150 nm. This allowed an intermediate layer to be formed with a (200) plane proving significant orientation, and significantly biaxially textured, and a superconducting layer to be significantly biaxially textured, and superconducting wires providing critical current densities of 0.1 MA/cm<sup>2</sup> and 0.5 MA/cm<sup>2</sup>, respectively, were obtained. (Applicants' specification, page 21, lines 14-21.)

Because Applicants' specification describes that an angle of greater than 25° would exhibit different properties from a crystal axis offset relative to an orientation axis by **at most** 25°, Applicants respectfully submit that a *prima facie* case of obviousness has not been established.

At least for the reasons explained, claim 3 is patentable over the cited references.

Claims 4-14 depend, either directly or indirectly, from claim 3. At least for this reason, claims 4-14 are patentable over the cited references.

Further, claim 6 recites: “. . . wherein the step of planarizing said textured metal substrate is performed by at least one of: mirror finished rolling; mechanochemistry; electrolytic polishing; and chemical polishing.” (Emphasis added.)

Further, claim 12 recites: “. . . wherein the step of planarizing said textured metal substrate is performed by at least one of: mirror finished rolling; mechanochemistry; electrolytic polishing; and chemical polishing. (Emphasis added.)

On page 4 of the Office Action, the Examiner contends that Akedo addresses these features and that it would have been obvious to combine Eyidi, Hans Thieme, Fujimoto, Hsu and Akedo to arrive at claims 6 and 12.

Applicants respectfully traverse these contentions. For example, Akedo discloses using a pressure apparatus to press a deposited film of ultra fine particles. (See Akedo, col. 5, lines 45-53.) Applicants respectfully submit that the described pressing of a deposited film does not address “. . . wherein the step of planarizing said textured metal substrate is performed by at least one of: mirror finished rolling; mechanochemistry; electrolytic polishing; and chemical polishing[.]” as recited in claims 6 and 12. (Emphasis added.)

At least for the above reasons, claims 6 and 12 are further patentable over the cited references.

### **New Claims**

Each of new claims 15 and 16 depend directly from claim 3. At least for this reason, new claims 15 and 16 are patentable over the cited art.

Further, claim 15 recites: wherein planarizing the textured metal substrate comprises planarizing the textured metal substrate such that the crystal axis is offset relative to the orientation axis by at most 12°.” (Emphasis added.)

Claim 16 recites: “wherein planarizing the textured metal substrate comprises planarizing the textured metal substrate such that the crystal axis is offset relative to the orientation axis by at most 10°. (Emphasis added.)

Support for these features can be found, for example, in page 5, lines 25-27, of Applicants’ specification.

As explained regarding claim 3, Fujimoto describes a substrate 4 having a discontinuous portion 1, at which an angle ( $\theta$ ) of 30° is formed. (See Fujimoto, col. 5, lines 22-24, and Fig. 7C.) The range recited in claim 15 (i.e., the crystal axis is offset relative to the orientation axis by at most 12°) and the range recited in claim 16 (i.e., the crystal axis is offset relative to the orientation axis by at most 10°) further distinguish the claimed methods from the cited references, including Fujimoto.

At least for these reasons, claims 15 and 16 are further patentable over the cited references.

### **Concluding Remarks**

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

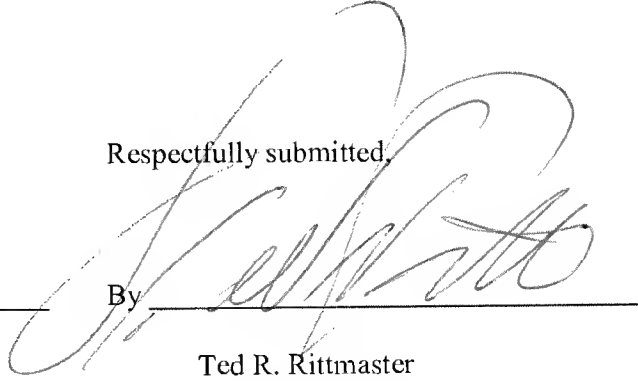
The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date

6/30/09

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